

## ABSTRACT

A manipulator for a mobile object which allows operating the mobile object with a natural feeling without difficulty irrespective of the physical condition of the user, and a push cart and a walker including such a manipulator are to be provided. The straight travel reference vector  $F_s$ , direction change reference vector  $F_c$  and rotating reference vector  $F_r$  are developed in advance based on the applied manipulating force of the user. An angle defined by the vector of the manipulating force applied by the user (applied manipulating force vector  $F_i$ ) and the straight travel reference vector  $F_s$  is denoted as  $\alpha$ , an angle defined by the applied manipulating force vector  $F_i$  and the direction change reference vector  $F_c$  as  $\beta$ , and an angle defined by the applied manipulating force vector  $F_i$  and the rotating reference vector  $F_r$  as  $\gamma$ . Herein the angles are illustrated as  $\alpha < \beta < \gamma$ , and the moving mode (straight travel mode in this example) is selected in relation with the reference manipulating force vector (the straight travel reference vector  $F_s$  in this example) that makes the smallest angle ( $\alpha$ ).